REMARKS

The present invention relates to a phenolic resin at the B-stage. As the Examiner realizes, the A-stage is an early stage in the polymerization reaction of certain thermosetting resins, especially phenolic resins, in which the material, after the application to the reinforcement, is still soluble in certain liquids and is fusible. In this stage it is also called resole. The C-stage is the final stage in the reaction of certain thermosetting resins in which the material is practically insoluble and infusible. The resin in this stage is sometimes referred to resite. The resin in a fully cured thermoset molding is in this stage.

Between the A- and C-stages is the B-stage, in which the material softens when heated and is plastic and fusible but may not entirely dissolve or fuse. It is also referred to as resistol. The resin in an uncured prepreg or premix is usually in the B-stage.

The present invention is related to a surprising fact described below.

Claims 1, 3 and 5-8 are presented for consideration on the merits. Claims 9, 10 and 12, withdrawn from consideration, may be canceled by Examiner's Amendment without prejudice to applicants' right to file a divisional application directed thereto, when the present application is otherwise in condition for allowance.

Of the claims considered on the merits, claim 1 is independent, and claims 3 and 5-8 are dependent.

The claims have all been rejected under 35 U.S.C. §103(a). Each rejection depends in part upon any of four Japanese patent publications of Yuka, namely '329, '870, '192 and '609. In the case of claims 1, 3, 5 and 6, three separate rejections respectively depend upon those patents in view of a U.S. patent to Taylor No. 4,292,105, a U.S. patent to Benzinger No. 3,617,613, and a U.S. patent to Casadevall No. 3,960,626. In the case of claims 6-8, a rejection depends upon a U.S. patent to Franz et al. No. 3,922,459 in view of the same Japanese patent publications, and in the case of claims 1, 3 and 5-8 a rejection depends upon a U.S. patent to Burke No. 3,619,342 in view of the same Japanese patent publications.

The rejections, which are carried forward from the Office action of May 8, 2002, are respectfully traversed. All of the claims are directed to a material to be molded comprising a porous material in which a phenolic resin which is a condensating polymer of a phenolic compound and an aldehyde and/or aldehyde donor is impregnated. The phenolic resin is at least partially sulfomethylated and/or sulfimethylated and the phenolic resin is at B-stage.

The invention as defined in the claims as now presented, including the features underlined in the previous paragraph, is neither disclosed nor suggested by the documents relied upon.

The Taylor patent (USP 4,292,105) discloses that the resins that are impregnated in fibrous textile material are usually thermosetting resins that are advanced to the B-stage (1:15-17). The Casadevall patent (USP 3,960,626) discloses that the fibers are preimpregnated

with the resinous material being used to construct the tape (5:47-50) and that the resin with which such fibers may be impregnated may be a standard, high temperature phenolic resin that has been partially cured to the B-stage to facilitate handling (6:19-22). The Benzinger patent (USP 3,617,613) discloses epoxy-impregnated woven fiber glass sheet and thermosetting resins such as phenol formaldehyde susceptible use.

This establishes merely that bringing a phenolic resin that is impregnated in a porous material to the B-stage is conventional.

Sulfomethylation and sulfimethylation of the phenolic resin are also conventional per se, as the four Yuka documents (JP 6270329, JP 7165870, JP 8121092, JP 5204609) demonstrate.

However, the purpose of the present invention is improvement of stability of the resin. The present invention makes use of the surprising finding that when phenolic resin is brought to the B-stage, it has much greater stability if it is sulfomethylated or sulfimethylated than if it is not. Please refer to Table 2 in Example 4 (page 38 of the application), in which phenol formaldehyde comparison resin F is neither sulfomethylated nor sulfimethylated.

It is clear that resin E, which is in accordance with the present invention, remains stable even 60 days after preparation, whereas resin F is already slightly unstable five days after preparation. In Table 2 the molding condition is one of the indicators of the stability. Adhesion testing using resins E and resin F is summarized below.

Ployester fiber spunbond unwoven fabric (50 g/m^2) was used in this test. Resins E and F were respectively impregnated in the unwoven fabric in an amount of 20 g/m^2 as solid. Each sample was then heated to dry it at 100°C for 10 minutes to put each resin E, F at the B-stage.

Each resulting test piece was stored for 10 days, 30 days, 60 days and 180 days at room temperature (25°C). After those respective storage periods, respective pairs of test pieces were pressed together at 98.0665 kPa at 200°C. The peeling strength of each test piece pair was then determined.

Peeling test was carried out by the method in US-K 6854-2 (180°C peeling test).

Width of the test piece: 25 mm

Stretching speed: 200 mm/min

The results are as follows:

Storage Time	Resin E	Resin F
10 days	31 N/25mm	29 N/25mm
30 days	30 N/25mm	20 N/25mm
60 days	27 N/25mm	0.1 N/25mm
180 days	26 N/25mm	0 N/25mm

Clearly, resin E of the present invention has excellent stability and maintains its adhesiveness even after storing for 180 days, while resin F is unstable and loses its adhesiveness after a mere 30 days. That result is not predicted by, and not obvious from, the

various combinations of documents relied upon in the Office action.

For the reasons stated, it is respectfully requested that the Examiner reconsider the application, withdraw the outstanding rejections under 35 U.S.C. §103(a), and issue a formal notice of allowance.

If a telephone interview would expedite the prosecution of the application, the Examiner is invited to call undersigned counsel.

Respectfully submitted,

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